CROP PRODUCTION NEWS

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CROPS

# Editor's Comments

**By Sean Miller, PAg, Crops Branch**

The Saskatchewan Ministry of Agriculture's June 9 ***Crop Report*** (http://www.agriculture.gov.sk.ca/Crop-Report) indicates that seeding in the province is about 79 per cent complete. This is up from 70 per cent complete the previous week.

For information on crop protection products, check out the ***Guide to Crop Protection 2011***. The spring update is also available at the same site: www.agriculture.gov.sk.ca/Guide_to_Crop_Protection. To make good use of the guide, growers and agronomists should also refer to the other valuable information it contains, such as:

- **Staging**: With the variable growing conditions this spring, crop and weed staging for pesticide application is not easy. The guide contains information and plant diagrams showing how to identify leaf stages.
- **Tank Mixing**: Weather conditions have limited the window of application this spring. The guide contains information on mixing pesticides.
- **Contacts:** A list of pesticide formulations, manufacturers and contacts is provided so the producer can obtain more detailed product information, if necessary.
- **Safety**: Safety is always of great importance when applying pesticides. The guide includes information on the safe use of products, as well as avoiding spray drift, cleaning tanks and disposing of containers.

**NOTE:** Throughout this document, you will see that some publications are in blue font and underlined, indicating links to website information. If you are reading this on your computer screen, click your cursor on the link to take you directly to the website. ✪

***Crop Production News*** is a bi-weekly publication prepared primarily by provincial specialists with the Crops Branch and Regional Services Branch of the Saskatchewan Ministry of Agriculture. It is a compilation of articles related to entomology, plant pathology, weed science, soils and agronomy issues.



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## IN THIS ISSUE:



Saskatchewan Ministry of Agriculture

# Crop Protection Laboratory Update

**By Philip Northover, AAg, Supervisor, Crop Protection Laboratory**

With the arrival of June, it is expected that the number of sample submissions will begin to increase as crops start to grow and develop. Submissions to date have been primarily weed/plant identifications and diseases observed on fall-seeded crops. With the cloudy and wet weather that has continued to make life difficult for humans and plants alike, we expect that new challenges are on the horizon.

Weeds that have been identified since the last update include: tall hedge mustard (*Sisymbrium loeselii L.*), a weed commonly associated with disturbed areas, roadsides and ditches; supine blue grass (*Poa supina*), a grass commonly used in mixes for shade-tolerant turfgrass; and Canada bluegrass (*Poa compressa*), a perennial grass found in moist to dry prairie areas, wet fields, rocky sites and roadsides.

Figure 1: Red turnip beetle larvae
Source: Saskatchewan Agriculture

The first insect to be submitted this year has been identified as a red turnip beetle larva (*Entomoscelis americana)*, a pest associated with a number of *Brassica* (cruciferous) plants. The adults are bright red with black stripes. This beetle can affect small portions of the plant or even cause significant defoliation and death. Crop damage tends to be patchy in fields and insecticide application is usually not economical unless confined to field margins and areas with significant plant damage. Smaller plants in early growth stages with less foliar growth are more vulnerable to feeding damage from the beetle larvae. Red turnip beetle infestations originate in stubble fields previously seeded to canola, rapeseed or mustard or in other fields containing heavy stands of weeds of the mustard family in the fall or early in the spring. For further information refer to the ***Red Turnip Beetle*** (http://www.agriculture.gov.sk.ca/Default.aspx?DN=4cc8d2a0-9fb3-4459-8e63-e306abfb9530) fact sheet.

To date, all plants submitted for disease diagnosis have been fall-seeded crops. This is not surprising considering the harsh winter followed by the moist spring in many parts of the province. A fall rye sample was diagnosed with cottony snow mould (*Coprinus psychromorbidus*). This fungus that can grow at temperatures well below freezing and is often associated with areas with little snow cover that are subjected to cold temperatures. While this disease does affect cereals, it tends to be more prevalent on forage legumes, notably alfalfa where the disease is referred to as winter crown rot.☼

# Agriculture Knowledge Centre Update

**By Brent Flaten, PAg, Integrated Pest Management Specialist**

Seeding alternatives and considerations in the wetter areas of the province dominated calls during the past week. Producers are asking about average days to maturity of various crops and varieties. There are some guidelines available in the ***Varieties of Grain Crops 2011*** (http://www.agriculture.gov.sk.ca/Varieties_Grain_Crops) fact sheet on our website. Other questions include timing of pre-seed burn-off, post-seed/pre-crop emergence burn-off, and early in-crop herbicide applications if the initial burn-offs were missed due to wet and/or windy weather. Some producers are inquiring about the potential risks and success of aerial or broadcast seeding of small-seeded crops. These types of seeding certainly have higher risk. It is necessary to harrow after seeding to maximize seed-to-soil contact and to bury as many seeds as possible. Some producers are gathering information on seeding winter wheat this fall on fields that are too wet to seed this spring. Others are considering the potential for volunteer crops. These often are not successful due to variation in crop stand, crop stage and weed pressure. Last year, many volunteer crops in the wetter areas were eventually terminated.

In-crop weed control questions are starting. These usually involve options for specific weeds in various crops. Some of the weed control issues discussed include the annual bromes (downy and Japanese), dandelions, cattails, leafy spurge, sticky willow herb and common burdock. Cold weather continues to cause concerns regarding slow weed kill with glyphosate and slow crop emergence. Several weed, disease and insect identification requests have come in. As mentioned in the last issue, another option is to send these samples to the Crop Protection Lab at 346 McDonald Street, Regina, SK S4N 6P6, or drop them off at one of our Saskatchewan Agriculture Regional Offices.

Soils-related issues are moving towards fertilizer options after the crop has emerged. This includes liquid dribble or stream banding and broadcasting granular fertilizer. Some producers wanting to seed pulses this late in the season have not been able to find inoculant. In this case, depending on cropping history, there may be enough residual rhizobium in the soil to produce a decent yield. If not, a significant amount of nitrogen fertilizer would be required and other seeding options should be considered. Also related to the late seeding, producers are asking about cutting nitrogen fertilizer rates to hasten maturity of the crop. It is challenging to come up with a definite recommendation since some of these late-seeded fields may be low in nutrients such as nitrogen to begin with, due to leaching or denitrification losses. However an abundance of nitrogen can delay crop maturity.

Forage questions are primarily regarding seeding new forage stands, including variety choices and seeding rates.☼

# Time to Keep an Eye on Sulphur Deficiencies in Canola and Mustard

**By Ken Panchuk, PAg, Provincial Specialist, Soils**

Sulphur application may be required if it was not added to canola and mustard crops prior to seeding, or if it stays wet and the root system is shallow. Additional sulphur may also be required if the yield potential of the crop has increased or if the rooting system is shallow, combined with the possibility of leaching of plant-available sulphur.

If sulphur is required, top-dress ammonium sulphate or dribble-band ammonium thiosulphate (ATS). Sulphur is not translocated within plants, so a supply of plant-available sulphur is needed within the rooting depth to supply the crop's needs until seed filling has been completed.

Figure 2: Sulphur-deficient canola at bolting to early flower stage.
Source: Saskatchewan Agriculture

Typical early symptoms of sulphur deficiency in canola or mustard include: upward cupping of the leaves; interveinal yellowing of the newest leaves; and, if very deficient, reddening/purpling of the underside of the cupped leaves, usually at the leaf margins. Later growth stage deficiency symptoms include: spindly plants with upwardly cupped leaves; leaves with reddening on the underside; prolonged flowering with small pale yellow flowers; poor pod development; and delayed seed filling. Sulphur deficiencies generally occur in irregular patches within fields, but can also occur field-wide.

Figure 3: Sulphur deficiency symptoms in canola.
Source: International Plant Nutrition Institute.

Plant-available forms of sulphur (ammonium sulphate or ATS) can be applied up to the flowering stage of canola or mustard; however, the earlier the application, the better the chance of capturing full yield potential. Caution: adding more nitrogen to a sulphur-deficient crop can reduce the yield further. Also, dribble-banding ATS can scorch leaves because of the high salt index; therefore, an earlier application helps minimize droplet contact with leaves.

For more details, see the Ministry of Agriculture website for the fact sheet ***Sulphur Fertilization in Crop Production*** (http://www.agriculture.gov.sk.ca/Default.aspx?DN=1910208b-760e-4582-ac32-56ed8980b5a6). ✿

# Assessing Your Crop Needs for Additional Nitrogen

**By Ken Panchuk, PAg, Provincial Specialist, Soils**

Crop scouting is an important management activity in crop production. Look for clues in the field to help determine if more nitrogen is required. Wet conditions may have resulted in shallow seeding operations that left the urea granules exposed or only slightly covered with soil. Urea is rapidly converted under warm, moist soil conditions. Therefore, nitrogen is more susceptible to loss, depending on the weather conditions. Similarly, shallow seeding in dry soil conditions may have also resulted in some nitrogen volatilization if the urea was exposed to dry and windy conditions.

Assessing the need for additional nitrogen starts with reviewing the realistic target yield based on the present growing conditions. If conditions have improved, then more nitrogen may be required to reach that yield potential. Review the levels of residual nitrogen from soil test information, total nitrogen applied to date, potential losses from volatilization and denitrification, and add potential nitrogen mineralization. Nitrogen mineralization can be higher or lower depending on weather and growing conditions; however, growing season mineralization generally means the mineralized nitrogen becomes available later in the growing season. The results should give you an estimate of how much additional nitrogen to apply.

There are several options for top-dressing additional nitrogen. One option is timing of broadcast urea or in combination with Agrotain to stabilize the urea for up to 10 to 14 days while waiting for rain to move it into the soil. Another option is broadcasting ESN (environmentally smart nitrogen), a polycoated urea that is protected until exposed to precipitation. The most popular method is to dribble or 'stream bar' band urea ammonium nitrate (UAN) with or without Agrotain (protects only the urea fraction for up to 10 to 14 days).

Application of top-dress nitrogen should be done at earlier growth stages to optimize yield potential. The best staging is before elongation for cereals and before the five-leaf stage for canola.

If additional nitrogen is needed for canola or mustard crops, consider blending some ammonium thiosulphate (ATS) with the liquid UAN. Also, ATS may help stabilize the UAN for a few days while waiting for some precipitation to move the droplets of fertilizer into the soil. Keep in mind that ATS has a high salt index and can scorch the leaves of canola.

If you have some nitrogen fertilizer left after seeding, consider broadcasting it on your grass hay and/or pasture land. With ample moisture, this is a good year to boost hay yield and/or quality, even with later applications on forages. ✿

# Spring Frost Damage to Crops

**By Sherrilyn Phelps, PAg, Regional Crops Specialist, North Battleford**

Early frost can be detrimental to crops, especially if their development has been delayed. The extent of damage caused by frost depends on the temperature, length of exposure, humidity levels, and time to reach freezing temperature. Due to the many factors involved, it is very hard to give a definite temperature above which crops can tolerate frost. Even if the air temperature reaches 0C, the crop itself can be 4 or 5C cooler, because plants can lose heat faster than the surrounding air.

In order to understand the effects of frost, one must understand plant cells. Plant cells contain not only water but also proteins, sugars, amino acids and other solutes that can lower the freezing temperature and protect the cells against intracellular ice formation (similar to antifreeze in your car). What this means is that even though water freezes at 0C, a plant cell may need temperatures of -4C or lower before the cells will freeze and damage occurs. Different parts of the plant, different stages of plant development and different types of plants can have varying levels of these 'antifreeze' compounds, resulting in a range of susceptibility to frost. Environmental conditions such as drought, cold temperatures, heat, etc, can also influence the levels of these compounds, and hence the tolerance of the plant to freezing temperatures. Typically, when a plant is exposed to stress, it becomes more hardened and this can moderately increase the tolerance to frost.

Frost damage occurs as moisture within the plant crystallizes and expands. This causes cell walls to rupture and fluid to leak out, hence the watery appearance of plant tissue or seed after a damaging frost.

**Effect of Moisture**

Cold air holds less water than warm air. As temperatures drop overnight to below the dew point (or 100 per cent on the humidity index), the air becomes oversaturated and condensation occurs. If this occurs close to the earth's surface, fog or dew forms. When water changes state from liquid to solid (ice), it gives off heat. So as the dew on the plant is exposed to freezing temperatures and undergoes the process of freezing, it gives off heat that can help keep the plant tissue above freezing. While water continues to freeze on the outside of the plant (extracellularly), it remains at 0C until all the water is in the frozen state. Once this occurs, the temperature can then drop and there is no longer heat to protect the plant. This is why the duration of the frost is critical.

**Spring Frost**

**Crops:** Spring frosts can damage germinating seedlings and the extent of damage will depend on the location of the growing point (above or below ground) and the level of anti-freeze properties contained within the plant. Exposure to cooler temperatures over time can harden off plants so that they are more tolerant to frost. A gradual change in temperature has a lesser effect than a dramatic change in temperature. Plants are able to resist injury if the temperature changes are gradual or are only encountered for a short period of time.

**(Continued on page 7)**

## Spring Frost Damage to Crops

**(Continued from page 6)**

Environmental conditions also play a role in crop tolerance to spring frost. Dry soil conditions and winds with high evaporation potential aggravate frost injury. Moist soil or heavy dew can reduce the injury.

Plants that have been hardened can survive lower temperatures than plants that have not been hardened. Cool conditions for a few days prior to a frost will help harden the crop. Plants can lose their hardened condition and improved tolerance to frost after exposure to warm temperatures and good growing conditions. Plants that are growing rapidly are damaged more by frost than those that are growing slowly. Other stresses that cause the plants to grow slowly can help harden the plants and protect them from frost damage.

**Cereals**: The growing point of cereals is below ground until approximately the five-leaf or jointing stage. This protects the plant from severe frost injury in the spring. The plants may lose above-ground leaf matter but will regrow from below ground. Partial injury can be seen when the tips of leaves or leaf edges become damaged and yellow and then turn brown and become brittle. Severe injury to cereals where all above-ground matter is damaged can result in a delay in maturity due to the plant having to regrow. Cereals have good frost tolerance and will tolerate frosts down to -4C and if hardened can withstand -6C.

**Flax:** Flax is quite sensitive to frost when it is coming out of the ground. Temperatures that reach -2C can injure flax up to the two-leaf stage. As flax grows, it becomes more tolerant to frost. After the two-leaf stage, flax can withstand temperatures down to -7C and even slightly lower if the plants have been hardened.

Frost canker can be a problem with flax during early stages of growth, and can reduce stands by as much as 50 per cent. Damage is most severe in thin stands on light soils and in low spots. Symptoms of frost canker are similar to heat canker. There will be plants or areas in the field where the plants have fallen over. At or near the soil surface, the plants will be girdled and have constricted stems.

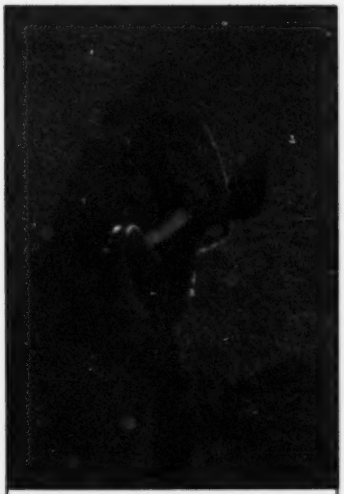

Figure 4: Frost-damaged canola with green viable growth in the centre.
Source: Saskatchewan Agriculture

**Canola**: Newly emerged canola at the cotyledon stage can be very susceptible to spring frosts. The growing point is above ground between the cotyledons. Plants at the three- to four-leaf stage are much more tolerant and can withstand a couple more degrees of frost. Typically, canola can tolerate temperatures down to -4C. Hardened plants can tolerate temperatures down to -7C and possibly below. Research by Agriculture and Agri-Food Canada (AAFC) at Beaverlodge showed that canola can tolerate temperatures of -8C to -12C if fall seeded or early seeded.

**(Continued on page 8)**

## Spring Frost Damage to Crops

**(Continued from page 7)**

A light frost that burns the leaves may not injure the growing point. If there is regrowth or green material at the growing point, then the plants could recover (Figure 4). It will take a few days to really assess the damage, and green growth should be visible after four to 10 days. Within the field, there can be damaged and undamaged plants close together (Figure 5). To be viable, the damaged seedlings' growing points need to be green and the stem healthy. Severely damaged plants will pinch off at the top of the stem and the whole seedling will brown off. For more information and photographs, see ***Tips for Assessing Spring Frost Damage in Canola*** (https://canola-council.merchantsecure.com/canola_resources/product37.aspx).

Figure 5: Canola seedlings damaged by frost.
Source: Saskatchewan Agriculture

**Peas/lentils**: Peas and lentils have good frost tolerance. They have growing points that remain belowground during early development. The aboveground material may be severely injured by frost but new growth will resume from the growing point and will appear approximately seven to 10 days after the frost.

**Spraying after frost:** As herbicides work best when crops and weeds are actively growing, spraying after a frost should be avoided. Wait at least 24 hours or preferably 48 hours after a heavy frost to allow the weeds and crop to recover and resume growth. The crop needs to be actively growing to prevent injury from the herbicide and the weeds need to be growing so the herbicide can work.

Spraying during the warmest part of the day when the plants are actively growing is also a good idea. For glyphosate applications, the air temperature should be greater than 8C for at least two to four hours.

Weed tolerance to frost will also determine how soon herbicides can be applied. The more tolerant the weeds are to frost, the sooner they can be sprayed. Winter annuals and dandelions have good frost tolerance. Other perennials, such as quackgrass and foxtail barley, are less tolerant, while Canada thistle and perennial sow thistle are the most sensitive perennial weeds.

**(Continued on page 9)**

**Spring Frost Damage to Crops**
**(Continued from page 8)**

**Summary**
The damage potential of frost is very hard to predict, as there are so many factors that affect the crop's tolerance. In general, -2C to -3C over a period of at least an hour is expected to cause damage to crops, and -1C for three to four hours can also cause similar damage. Evaluating the damage is difficult. Initial symptoms should be evaluated approximately 24 to 48 hours after the frost, and it may take up to seven to 10 days before the full extent of damage is known. Heavily damaged crops will quickly show signs of frost injury, including discoloration, darkening and water soaked appearance of fleshy tissue. ☼

# Cleaver Control is a *Complex* Problem

**By Clark Brenzil, PAg, Provincial Specialist, Weeds**

The cleavers complex is an increasing concern for crop producers in Saskatchewan. Cleavers is referred to here as a complex since it comprises two species: cleavers (*Galium aparine*) and false cleavers (*Galium spurium*) that are very difficult to distinguish from one another visually. There is some suggestion in the research that cleavers may have a preference to shadier, forested habitat and false cleavers to more open, meadow-type habitat, leading some experts to believe that the primary species of concern to prairie agriculture is false cleavers. For the most part, management is the same for both species.

Management of the cleavers complex is a particular concern in canola because of the similarity in size and shape of the seeds of each plant. But management concerns span several crops, since the clinging habit can interfere with harvest.

Both species in the cleavers complex have been reported to act as winter annuals and, when this occurs, it has been observed that root development is more extensive than shoot development. When compared to annual growth, there is generally a reduced amount of shoot growth during the fall. These characteristics of winter annual types not only make them more vigorous but also make them appear to be smaller than they are in reality. As a result, burnoff glyphosate rates between 360 to 540 grams acid equivalent (g ae) per acre are more appropriate to achieve adequate control. It is critical to control winter annual types at the time of burnoff, since managing them in-crop is difficult.

Several herbicide options are available for control of cleavers in cereal crops based on the active ingredients in Group 2 (imazamox, florasulam, thifensulfuron, pyroxsulam), Group 4 (fluroxypyr, quinclorac, mecoprop, dicamba), and Group 27 (pyrasulfotole) or combinations of these actives with each other or with other herbicides. In canola, glyphosate, *Liberty*, and either *Solo* or *Odyssey* offer control in their respective herbicide-tolerant crops (glyphosate-tolerant Liberty Link and Clearfield).

**(Continued on page 10)**

**Cleaver control is a *Complex* Problem**
**(Continued from page 9)**

Field peas rely heavily on the Group 2 class of herbicides (imazamox, imazethapyr) or Group 6 (*Basagran*), and control in flax is limited to *Basagran*. Because of their contact activity, *Liberty* and *Basagran* need to be applied at an early stage of cleavers development to be effective.

Herbicide resistance to Group 2 and Group 4 herbicide has been recorded as well as multiple Group 2 and 4 resistant cleavers. Surveys conducted by Dr. Hugh Beckie of Agriculture and Agri-Food Canada in Saskatoon found Group 2 resistance in cleavers in 17 per cent of sites surveyed in 2007 in Alberta. Modeling conducted by Dr. Beckie has also shown cleavers to be at risk for development of glyphosate resistance.

The winter annual growth habit and growing resistance to Group 2 herbicides will make the cleavers complex a challenge to control, now and in the future. ✡

# Cutworm Management

**By Scott Hartley, PAg, Provincial Specialist, Insect and Vertebrate Pests**

Cutworms have been a common insect concern for producers in the spring of 2011.

In 2010, cutworm infestations affected crops across the Prairies. Many reports included more than one species in the same field. The Agriculture Knowledge Centre noted that the majority of reports were of cutworms in canola crops.

Female cutworm moths' eggs are laid in August and early September of the preceding year. Clean fields are not preferred targets for egg-laying females. Areas that had weeds or green growth are more prone to problems, as the adult moths look for green growth in which to lay their eggs.

In general, there have been two groups of cutworms. Eggs from species such as the dingy cutworm will hatch in the fall and over-winter as larvae. These are therefore usually larger cutworms earlier in the season. They also tend to be above ground, and feed on emerged green foliage. Due to their advanced stage and size, they are capable of consuming substantial areas of crop. But the early start means they will also often complete their larval stage by about mid-June, depending on climatic conditions.

Species such as the red-backed cutworm over-winter as eggs and are more typical in feeding habits characteristic of their name, cutting off plants at or just below the soil surface. When a plant is pulled, the root is seldom attached. Occasionally, damage has been noted on lower leaves and could be from chewing prior to emergence.

**(Continued on page 11)**

**Cutworm Management**
**(Continued from page 10)**

Damage from this group of cutworms is more likely to continue until the end of June and possibly into July before feeding ceases and pupation begins.

Typically, cutworms are more likely to cause damage on hilltops, south-facing hillsides and drier areas of a field. However, this is not always the case and some species of cutworm may be found causing problems in wetter areas.

Regular field scouting is important since early detection can be critical, especially for more vulnerable, younger plant stands. Economic thresholds should be used as a guide for initiating control measures. The severity of damage will be directly related to the health and vigour of the growing crop. Slower growing plants and crops under stress will suffer more from cutworm feeding.

Proper identification is important in determining management options since not all larvae in the soil are cutworms. Some soil-dwelling invertebrates are inconsequential and may even be beneficial. However, if crop damage is a result of cutworm feeding, chemical control may be an option, depending on the crop. Refer to the ***2011 Guide to Crop Protection*** (http://www.agriculture.gov.sk.ca/Guide_to_Crop_Protection) for registered products in various crops. Economic thresholds are also included wherever possible.

Insecticides should be applied by spray to the soil surface in the evening. When the cutworms come to the soil surface to feed, they come in contact with the chemical. Higher water volumes can result in better coverage and soil penetration. As vegetative growth progresses, the crop canopy will prevent much of the chemical from reaching the soil surface or intended target, resulting in reduced efficacy. It can take up to 10 days to achieve optimum results as not all larvae come to the surface to feed on any given night. In addition, cutworms spend a considerable amount of time below ground going through larval stages that include periods of moulting when the insects are not feeding.

Keep in mind that attempts to control advanced infestations may not be as successful. Determine the size of the larvae present. Larger larvae, generally longer that 1.25 inches, will be nearing the end of their destructive stage. Depending on the species, by late June or early July, cutworms will have completed the larval phase of their life cycle, feeding will cease and pupation will begin. Chemical control efforts will not be effective and will be an unnecessary expense. ✿

# Regional Crops Specialists - Who's Who

**By Lyndon Hicks, PAg, Regional Crops Specialist, Yorkton**

The Saskatchewan Ministry of Agriculture's regional crops specialists are located in 10 offices around the province. With the spring announcement of seven additional satellite offices, specialists are even more accessible to the agricultural community and local farmers.

Our mandate is to ensure farmers, ranchers, producer groups and industry have access to production and business information and services. Extension activities are part of the service, and include training events, meetings and field calls. We encourage anyone in the agricultural industry to call us with questions. We are dedicated to getting you the information you need to make your farm successful.

**Kindersley - John Ippolito, PAg - 463-5442**
**john.ippolito@gov.sk.ca**

John has a Bachelor of Science in Agriculture from the University of Saskatchewan. He has worked in agriculture extension with a focus on crop production and farm management since 1987. His main areas of focus have been specialty crop production with an emphasis on lentils and canary seed.

**Swift Current / Shaunavon Satellite Office - Shannon Chant, PAg - 778-8291**
**shannon.chant@gov.sk.ca**

Shannon grew up on a grain farm southwest of Regina and has a Master of Science and Bachelor of Science in Agriculture in plant sciences from the University of Saskatchewan. Since joining Saskatchewan Agriculture, she has worked in various regions in western Saskatchewan. Shannon is especially interested in new crops, value-adding and providing producers with results from local research.

**(Continued on page 13)**

**Regional Crops Specialists – Who's Who**
**(Continued from page 12)**

**Moose Jaw / Assiniboia Satellite Office - Daphne Cruise, PAg - 694-3587**
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Daphne has a Bachelor of Science in Agriculture from the University of Saskatchewan with a major in environmental science and a minor in rangeland resources. She comes from a cattle and grain farm near Findlater and currently farms with her husband at Stalwart. Daphne worked with the Agriculture Knowledge Centre, first as an agrologist intern, and now as a regional crops specialist. Daphne also works on the Crop Report, and with the Saskatchewan Young Ag-Entrepreneurs and the Agriculture in the Classroom program.

**North Battleford / Meadow Lake and Lloydminster Satellite Offices - Sherrilyn Phelps, PAg, CCA - 446-7475**
**sherrilyn.phelps@gov.sk.ca**

Sherrilyn has a Master of Science and Bachelor of Science in Agriculture from the University of Saskatchewan. Sherrilyn brings education and experience in agronomy, research and business development to Saskatchewan Agriculture. She continues her involvement with field research through association with the Western Applied Research Corporation, and Agriculture and Agri-Food Canada. As a regional crops specialist, Sherrilyn works in applied research, helping producers and the agricultural industry adapt to changing practices and opportunities in crop production and use.

**Outlook - Ian Schemenauer, AAg - 867-5506**
**ian.schemenauer@gov.sk.ca**

Ian grew up on a farm in the St. James area east of Lake Lenore. He recently graduated from the University of Saskatchewan with a Bachelor of Science in Agriculture, specializing in plant sciences, with minor in economics. He has spent two summers working for Cargill in their Crop Scout Program and was also a research assistant in the Department of Plant Sciences at the University of Saskatchewan. In addition to working on his family's farm, Ian has volunteered for various organizations, including the Big Brothers Big Sisters Mentorship Program.

**(Continued on page 14)**

(Continued from page 13)

**Tisdale - Kim Stonehouse, PAg - 878-8807**
**kim.stonehouse@gov.sk.ca**

Kim holds a Bachelor of Science in Agriculture, a Master of Science in Agricultural and Bioresource Engineering and a Master of Science in Environmental Engineering. Before joining the Saskatchewan Ministry of Agriculture, he conducted agricultural research for the East Central Research Foundation in Canora. Kim works with producers to solve crop production problems, identify applied research opportunities and assist producers in adopting new crop production technology to make their farms and businesses more profitable.

**Prince Albert - Shannon Urbaniak, PAg - 953-2362**
**shannon.urbaniak@gov.sk.ca**

Shannon's background includes a Bachelor of Science in Agriculture majoring in biology from the University of Saskatchewan and a Master of Science in Plant Science from the Nova Scotia Agricultural College, where she researched novel oilseed crops with a focus on Camelina. Shannon brings valuable experience in the areas of applied research, agronomy, business development and organic agriculture. Shannon has been with Saskatchewan Agriculture for four years and worked in the Watrous Regional Office prior to her transfer to the Prince Albert Regional Office.

**Weyburn / Estevan Satellite Office - Elaine Moats, PAg - 848-2856**
**elaine.moats@gov.sk.ca**

For over 30 years, Elaine has provided technical assistance to farmers on a wide range of topics, including crop pests, agronomy and evaluation of potential new crops. One of her strengths is the ability to link producers, research and industry partners to develop programs, projects and strategies. She has a specific interest in sunflower, pulses and forage establishment, and is involved with the Saskatchewan Sunflower Committee, finding new opportunities for sunflowers. She serves as a resource to the Agri-ARM site at Redvers. Elaine holds a Degree in Agriculture from the University of Saskatchewan.

(Continued on page 15)

**Regional Crops Specialists – Who's Who**
**(Continued from page 14)**

**Yorkton / Moosomin Satellite Office - Lyndon Hicks, PAg - 786-1508**
**lyndon.hicks@gov.sk.ca**

Lyndon has a Bachelor of Science in Agriculture from the University of Saskatchewan with a major in Plant Science. Lyndon started with the Ministry of Agriculture in 2009 and has since worked out of the Tisdale and Yorkton regional offices. Lyndon will provide technical information on all aspects of crop production and management as well as work with producers and industry on local applied research. Lyndon is originally from a mixed farm near Mortlach, Saskatchewan and currently resides in Yorkton. ☼

## Agriculture Knowledge Centre

**Hours:** 8 a.m. to 5 p.m. Monday to Friday
**Phone:** 1-866-457-2377

**Got a question?**
E-mail: aginfo@gov.sk.ca
**Want to submit your question online?**
Go to our http://www.agriculture.gov.sk.ca/ask_saskatchewan_agriculture form page.

For information about submitting samples to Saskatchewan Agriculture's Crop Protection Lab go to:
www.agriculture.gov.sk.ca/Crop_Protection_Lab;
or phone (306) 787-8130.

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